

Energy Education news



SPRING 2017

inside
this issue...



3

Solar Regatta



3

12th Annual
Solar Car Race



4

Electricity Fair



4

Freedom Schools



5

Earth Day Tips

PLUS:

Teacher Workshops
& More



Tiny House Competition

SMUD's 2016 Tiny House Competition was inspired by the U.S. Department of Energy's Solar Decathlon. College teams competing in the Solar Decathlon have a baseline cost of \$250,000, with many teams spending over 1 million per house. SMUD set out to find a new way to make this type of educational opportunity more accessible to schools lacking that level of funding and administrative support.

We decided to scale down the Solar Decathlon approach and instead used tiny houses on wheels to teach about energy in this very unique design/construction competition. The Tiny House Competition was broken into 4 judged categories: Architecture, Communications, Energy and Home Life. The point structure was simplified and each house was required to be zero net energy and 100% off-grid to make transporting and exhibiting the houses less expensive and less time-consuming for the student teams.

Preparation for the competition began in 2014. Schools checked in with SMUD during the construction process by attending monthly phone conferences. Reports consisted of videos, which can be viewed in YouTube. As building progressed, the Energy Education & Technology Center (EE&TC) staff took the time to personally meet with each team at their campus, preview the build and offer suggestions and advice.

Continued on page 2 >>



The following schools participated in the competition:

California State University, Fresno

Laney College

College of the Sequoias

University of California, Berkeley Graduate Program

Cosumnes River College

Santa Clara University

San Jose City College

UC Santa Cruz and Cabrillo College

(last minute cancellation)

California State University, Sacramento

California State University, Chico

The actual competition began on Oct. 9 when the teams arrived at the Cosumnes River College campus. Each team was given a 60' x 50' lot to set up their house. Redwood fencing was provided to help create a more intimate 40' x 40' house lot. The houses were arranged on streets forming a quadrant with a centralized town square. The Association of Landscape Architects assisted in transforming a parking lot on the Cosumnes River College campus to become a real, live working village with street signs, trees and greenery, park benches and a central park with an all-American gazebo.

Each house was designed to be mindful and purposeful. We asked that each team create a target client and end-use environment. For example, the College of the Sequoias' house was built as a guest house to be placed by Puget Sound, WA. Santa Clara University planned to donate their tiny house to Operation Freedom Paws to house a returning vet with a service animal. Each lot was decorated and accessorized to add authenticity to the story told by each team.

SMUD subject matter experts and our partner, ADM, measured zero net energy, ambient temperature, shower flow, refrigerator and freezer temperatures, cooking simulation, electronic simulation, lighting, etc. on a daily basis from Wednesday, Oct. 12 to Friday, Oct. 14. Each evening, the energy scores were tallied, accumulated and displayed at tinyhouserresults.admenergy.com. The students were also judged subjectively by subject matter experts in the areas of communication, home life, architecture and energy.

Awards were presented to the winning teams on Saturday, Oct. 15. Award money was provided by our partner, Raley's Family of Fine Foods and other sponsors.

- **Champion:** Santa Clara University - \$10,000
- **Home Life:** UC Berkeley - \$4,000
- **Communications:** Santa Clara University - \$4,000
- **Architecture:** Laney College - \$4,000
- **Energy:** Santa Clara University - \$4,000
- **People's Choice:** College of the Sequoias - \$1,000

The list of additional awards, as well as photos and video, can be found at smud.org/TinyHouse.

The tiny houses were open to the public for viewing after awards were presented. The estimated attendance was 20,000 and some visitors experienced a 2-hour wait. Despite the long wait to see the houses, SMUD customers were very pleased that the popular tiny house experience was brought to Sacramento.

In addition to the tours, we offered a series of "Tiny Talks" on a main stage covering topics that ranged from the popularity of tiny houses to sustainable living and electric vehicles.



May 5 and 6, 2017



Solar Regatta

May 5 & 6, 2017

Come and visit the 6th annual Solar Regatta, which will be held at the lake at Rancho Seco in Herald, California. This event is sponsored, organized and run by SMUD's EE&TC and the Community Solar program. High school students will race their boats on Friday, May 5. The winning team will go on to race against the college teams on Saturday, May 6.

The Solar Regatta is a hands-on event where students learn about renewable energy using solar as the learning vehicle. This is a creative, engineering, design/build competition where the students can retrofit an existing boat or build a new one.

The solar boats will be judged for speed, distance, maneuverability and more. See the Solar Regatta Reference Manual at smud.org/Solar-Regatta for details. Please email Suzette Bienvenue at suzette.bienvenue@smud.org for more information.



12th Annual Solar Car Race

April 19, 2017

High school students that would like to design, construct and compete should consider racing in the 2017 Solar Car Race at Cosumnes River College. To be eligible, your school or outreach group, such as Boy Scouts or school clubs, must be in SMUD's service area and students must be in grades 9-12. A teacher or mentor must contact us before students can start racing. We'll distribute up to 6 solar car kits and the Junior Solar Sprint race rules to those interested in participating. You may have up to 12 students racing at the event at Cosumnes River College.

Student teams will design and construct the race cars, which will have a removable solar module. Some schools choose to have an earlier race-off at the school, with winners moving on to Cosumnes River College for race day. It's a fun race and is held during the CRC Earth Week activities. The race venue will also feature examples of the automotive technology shop work, innovative fuel models and technologies and exhibit personal electric vehicles courtesy of the Sacramento Electric Vehicle Association. This is a great way for students to sit behind the wheel and discover what they may be driving after graduation.

The deadline to register for the Solar Car Race at Cosumnes River College is Feb. 15. Email Suzette Bienvenue at suzette.bienvenue@smud.org to register your school and get your free solar car kit. Visit smud.org/Solar-Car-Race to learn more.





SMUD's Suzette Bienvenue, member of SMUD's EE&TC group, along with David Bowker, AKA Mr. Electricity. David teaches SMUD's electricity workshops and is a science teacher in the San Juan Unified School District.



Become a college intern at SMUD! Jennifer Garcia (CSUS Accounting) and Kaelin Sherrel (CSUS Finance) work for SMUD's EE&TC.

Electricity Fair

On Sept. 10, 2016, more than 1,200 visitors came to celebrate everything electric at the historic Folsom Powerhouse. California State Parks personnel and docents gave tours of the powerhouse, museum and grounds. Visitors learned the historical importance of this first location for the long-distance transmission of power (22 miles) from Folsom to Sacramento in 1895. This transmission of electricity was a catalyst in developing the economy and the future of Sacramento. Volunteers from Pasteur Middle School shared engaging hands-on activities at various learning stations. Children made pinwheels (wind energy), UV bead bracelets, and solar baked clay medallions (solar energy).

Several solar-powered boats that competed in the California Solar Regatta were on display. Families learned more about electric vehicles, courtesy of the Sacramento Electric Vehicle Association. The Electricity Fair is a magnet for students in 3rd and 4th grades, and the many historical and scientific aspects meet Common Core and Next Generation Science Standards (NGSS).

Mark your calendar for this year's Electricity Fair, which will be held on Sept. 9, 2017. For more information on how to integrate this family event into your classroom's electricity curriculum, please email suzette.bienvenue@smud.org.

Freedom Schools

SMUD is proud to be community partner with Project Freedom Schools and we're bringing STEM (Science, Technology, Engineering & Mathematics), and energy education to underserved areas in Sacramento. Students learn about the science of energy in a fun and interactive way, experimenting with solar-powered race cars, making pinwheels and making solar-powered bead bracelets.

SMUD's EE&TC staff worked with educators and students to teach sustainable practices. One of the many activities that took place was to have the students make solar cookers. These simple cardboard devices covered with foil used the power of the sun to cook food. The cookers were taken home with the families along with more information on how they can reduce energy costs at home.



?

Did you know?

A crack as small as 1/16th of an inch around a window frame can let in as much cold air as leaving the window open 3 inches!



Create a Recycling Center

A classroom recycling center is a great way to get kids excited about recycling. You can reduce the burden of sorting materials by designating a student "recycle ranger" to make sure everything is in its place.



Upcycled Art

Reuse discarded items to decorate bulletin boards and classroom displays. Create art contests with common trash. Which student can make the most eco-friendly house from a cereal box? Pinterest has some beautiful examples to help spark your imagination!



Get Some Fresh Air

Adding plants to your classroom is a great way to incorporate nature into your teaching space and purify the air.

Creative Organizers

Create craft and office supply organizers from common household goods. Use plastic milk cartons to create a student supply center or use cans to create portable supply caddies. Get the school cafeteria to participate.



Scratch Paper

Create a special bin for scratch paper that has only been used on one side. Encourage students to use a paper cutter to create specially sized paper for specific tasks and have the students use paper from the bin before using a new piece of paper.

Recycle Math

Practice graphing and data analysis skills by creating a "green data wall". At the end of each week, count up the number of bottles and cans in your recycle bins and weigh recycled paper. Create a graph in your classroom to track your recycling efforts over time. Incentivize students with parties and prizes for increasing the number of items recycled.

Eco-friendly Supplies

Acid-free glue sticks create fewer messes than liquid glue and are better for the environment. Use environmentally friendly cleaning products or make your own with vinegar and baking soda. Go old school and use chalk instead of whiteboard pens, which have a strong chemical odor. There are also natural alternatives to using petroleum-based crayons.

Use Refillable Dry Erase Markers

If you need to use dry erase markers, you can now purchase more environmentally friendly refillable markers, which help reduce landfill waste.



Let in the Breeze

Turn off heating or cooling units and open the windows when the weather is nice. Enjoy the fresh air!

Get Ready for Earth Month



As your class gears up for Earth Month, look into this list of ways to bring green to your classroom.



Power Down

Reduce energy use by turning computers off instead of putting them in sleep mode when leaving school.

Don't Block the Airflow



Books and other bulky items absorb warm and cool air coming from heating and cooling units. Be sure to keep vent areas clutter-free to maximize efficiency.

Stop Leaks

Heat can escape through windows. Have students determine areas of energy loss by creating "draft meters" made from thin plastic wrap and pencils. Create a lesson where students use draft meters to identify leaks. Report major leaks to your custodial staff for repair.

Create "Green Teams"

Student jobs make cleaning up the classroom easier. Put students in "green teams" and use the last 5 minutes of class to power down computers, close the blinds, check faucets, and sort recycling.

Conduct an Energy Audit

SMUD offers simple energy audit lessons online. Have students brainstorm ways they can reduce energy consumption in the classroom as a follow-up activity.

Skip the Brown Bag

There are many practical (and cute) lunchboxes on the market. Be sure to talk to your students about the importance of using reusable containers. Create a sewing project and show students how to sew napkins and lunch sacks.

Reduce Paper, Go Digital

Electronic calendars, grade books and worksheets are great tools that can be synced directly to a student smart phone or tablet. Encourage students to use productivity apps to generate digital to-do lists with reminders on the go.



Get Green Certified

The U.S. Green Building Council offers a Green Classroom Professional Certificate course to encourage educators to make environmentally-conscious decisions within their school. Participants can complete the online course training in about two hours.





New Teacher Workshop:

Advanced PV - Emergency Preparedness

Last November, SMUD, in partnership with California State Parks and Solar Schoolhouse, offered an emergency preparedness workshop for high school and community college teachers. Participants designed and constructed solar-powered "notebooks" which could be used to power portable lighting and walkie-talkie systems at their schools during emergencies.

Teachers learned how to solder electronics and wire the portable and rechargeable solar systems.

SMUD Career Ambassador Program

The SMUD Career Ambassador Program is made of employees who volunteer their time to talk with students about the careers that SMUD has to offer and about their personal educational and career pathways.

Have a career related event coming up (Career Day, STEM Fair, Mock Interviews, etc.)? Contact Liz Miranda at (916) 732-6721 or educationoutreach@smud.org to ask a SMUD Career Ambassador to attend your event!



?

Did you know?

A heavy coat of dust on a light bulb can block up to half of the light. Help your family dust!

Solar Champion Program

SMUD's EE&TC provides free classroom solar kits to teachers. The goal is to have at least one solar classroom kit available at each elementary school in SMUD's service area. To request a solar workshop for your district, your district science administrator or professional development director can contact us to set up a class. You must have a minimum of 30 teachers (public and/or private) from your district attend the workshop, which will be held at no cost at our Energy Education & Technology Center. Teachers receive a solar classroom kit and solar-powered fountain kit (one per school), classroom curriculum and materials, professional development hours, breakfast and lunch.

For more information, email suzette.bienvenue@smud.org.



Teacher Workshops 2017

These workshops are open to teachers in K-12+ and outreach educators like the Girl and Boy Scouts. Register for classes at smud.org/Workshops.

I Can Afford College

Saturday, Feb. 11, 2017

10 a.m. – 11 a.m.

Location: SMUD Customer Service Center
6301 S Street, Sacramento, CA

Find out what financial and planning resources are available to help you go to college. This session will provide information on financial aid, including the SMUD Powering Futures Scholarship, and will highlight opportunities to transfer from a community college to a California State University (CSU) campus. A panel discussion will include speakers from the “I Can Afford College” campaign and local financial aid experts to help you determine what aid you may qualify for and how to apply.

Chemical Reactions (Grades 3- 8)

Wednesday, Feb 22, 2017

4 p.m. – 7:30 p.m.

Location: Folsom Powerhouse Museum
9980 Greenback Ln, Folsom, CA

Teachers learn how an ordinary ziplock bag becomes a safe and spectacular laboratory to mix chemicals that bubble, change color and produce gas and heat. This is a great way to learn about energy transfer. Teachers receive a Great Explorations in Math and Science (GEMS) teaching guide and classroom materials.

Cabbages and Chemistry (Grades 3-8)

Thursday, March 9, 2017

4 p.m. – 7:30 p.m.

Location: Folsom Powerhouse Museum
9980 Greenback Ln, Folsom, CA

Through simple and engaging activities, teachers learn how to use cabbages to teach students to investigate acids and bases. The learning unit will help children use experimentation to discover the differences between acids and bases and their relationship as part of a continuum. The classroom activities will help explain how chemicals are grouped by behaviors and how chemistry connects to everyday life. Teachers will receive a GEMS teaching guide and classroom materials.

Project WET (Grades K-12)

Saturday, April 15, 2017

9:30 a.m. – 3:30 p.m.

Location: Effie Yeaw Nature Center
2850 San Lorenzo Way, Carmichael, CA

All K-12 educators are invited to join us for an interdisciplinary experience in activities to engage students in learning about watershed processes and human history along the banks of the American River, while learning about concepts and skills at the heart of Common Core and NGSS. Participants will receive the Project WET 2.0 Guide with access to over 110 Common Core and NGSS correlated activities!



“Tell me and I forget. Teach me and I remember. Involve me and I learn.”

-Benjamin Franklin

Solar Scholarships for Teachers

SMUD offers 5 teacher scholarships to attend the weeklong Summer Solar Camp at the Raus Institute during the week of July 17, 2017. This opportunity is only open to teachers or outreach educators, e.g. for Boy Scouts or Girl Scouts, in schools located in Sacramento County.

For information or to apply go to solarschoolhouse.org



Winter is almost over

Here are some very simple energy saving tips to get ready for the warmer weather:

- 1** Service your air conditioner. Easy maintenance, such as routinely replacing or cleaning air filters, can lower your cooling system's energy consumption by up to 15 percent.
- 2** Open windows. Opening windows creates a cross-wise breeze, allowing you to naturally cool your home without switching on air conditioners. This is an ideal tactic in spring when temperatures are mild.
- 3** Use ceiling fans. Refreshing your home with ceiling fans will allow you to raise your thermostat four degrees. This can help lower your electricity bills without sacrificing overall comfort.
- 4** Cook outside. On warmer spring days, keep the heat out of your home by using an outdoor grill instead of indoor ovens.
- 5** Install window treatments. These devices not only improve the look of your home but also reduce energy costs.
- 6** Caulk air leaks. Using low-cost caulk to seal cracks and openings in your home keeps warm air out and cash in your wallet.
- 7** Bring in sunlight. During daylight hours, switch off artificial lights and use windows to light your home.
- 8** Set the thermostat. On warm days, setting a programmable thermostat to a higher setting when you are not at home can help reduce your energy costs by approximately 10 percent.
- 9** Seal ducts. Air loss through ducts can lead to high electricity costs, accounting for nearly 30 percent of a cooling system's energy consumption. Sealing and insulating ducts can go a long way toward lowering your electricity bills.
- 10** Switch on bathroom fans. Bathroom fans suck out heat and humidity from your home, improving comfort.

SMUD's Energy Efficiency Career (SEEC) Exploration Program

Through the SEEC program, 7 teachers from 5 Sacramento-area high schools conducted an energy efficiency audit last summer at a local business. They got the necessary tools, background and real-life experiences to complete a true business audit.

Teachers are now taking the knowledge they gained back into the classroom to deliver a hands-on curriculum for students. This year, more students will choose a nearby business and conduct their own energy efficiency audit. The students will create and present a final report for the business.

Classrooms will receive support from SMUD account managers to make sure their report is professional and includes the range of SMUD's energy-saving options. Students will also meet with others in the energy industry to learn about associated careers. Teachers earn \$1,500 for participating.

To be eligible to participate in the program, a teacher must:

- Teach in a high school classroom in Sacramento County (any subject)
- Be willing to attend a week-long summer workshop at SMUD (food included)
- Be willing to incorporate SEEC tools related to energy efficiency into a classroom or school club

Contact Susan Wheeler (susan.wheeler@smud.org) or call (916) 732-6540 to participate or learn more.



SMUD®

Sacramento Municipal Utility District
Energy Education & Technology Center
6301 S St.
Sacramento, CA 95817-1899